WRAP DISPLAY SYSTEM HAVING A FLEXIBLE DISPLAY

FIELD OF THE INVENTION

The present invention generally relates to flexible displays. The present invention specifically relates to an efficient incorporation of a flexible display into a display system.

BACKGROUND

Rolling display systems currently employ flexible displays that are rolled into a case for facilitating a storage of the flexible display therein, and unrolled out of the case for facilitating an operation of the flexible display. An example of such a display system disclosed in U.S. Patent Application Publication No. US 2002/0196205A1. Within the case, the flexible display can be wrapped around various display driving components within the case whereby either a rolling radius of the flexible display must be large enough to support immobile display drive components within the case and/or movement among display drive components within the case is required to facilitate the rolling/unrolling of the flexible display. One drawback to this rolling/unrolling approach of the flexible display are the limitations imposed on a construction of an optimal shape of the case with minimal dimensions for purposes of achieving a highest degree of portability of the case at minimal cost. The display industry is therefore continually striving to improve upon an incorporation of a flexible display into a display system.

SUMMARY OF THE INVENTION

To this end, the present invention provides new and unique structural forms of a wrap display system having a flexible display that is wrapped around a stick for facilitating a storage of the flexible display and unwrapped from the stick for facilitating an operation of the flexible display. In one form of the present invention, a flexible display unit includes a display cover integrated with the flexible display wherein a section of the display cover is coupled to an external surface of the stick. In a second form of the present invention, a flexible display unit includes a display cover integrated with the flexible display wherein a section of the display cover is permanently wrapped around the stick. In a third form of the present invention, a flexible display unit includes a display cover integrated with the flexible display and a holdout mechanism having an energy stable position for fixing the flexible display in a readable position with respect to the stick when the flexible display is unwrapped from the stick.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing forms as well as other, features and advantages of the present invention will become further apparent from the following detailed description of various embodiments of the present invention, read in conjunction with the accompanying drawings. The detailed description and drawings are merely illustrative of the present invention, rather than limiting the scope of the present invention being defined by the appended claims and equivalents thereof.

FIG. **1** illustrates a front view of a first embodiment of a flexible display unit in accordance with the present invention without a holdout mechanism;

FIG. **2** illustrates a front view of a second embodiment of a flexible display unit in accordance with the present invention without a holdout mechanism;

FIG. **3** illustrates a perspective view of one embodiment of holdout mechanism in a rolled up position in accordance with the present invention;

FIG. **4** illustrates a front view of a third embodiment of a flexible display unit in accordance with the present invention with the holdout mechanism illustrated in FIG. **3**;

FIG. **5** illustrates a front view of a fourth embodiment of a flexible display unit in accordance with the present invention with the holdout mechanism illustrated in FIG. **3**;

FIGS. **6** and **7** illustrate a front view and a side view, respectively, of a first embodiment of a stick in accordance with the present invention;

FIG. **8** illustrates a perspective view of the holdout mechanism illustrated in FIG. **3** wrapped around the stick illustrated in FIGS. **6** and **7**;

FIG. **9** illustrates a perspective view of a embodiment of a wrap display system in an unwrapped state in accordance with the present invention.

FIGS. **10** and **11** illustrate a front view and a side view, respectively, of a second embodiment of a stick in accordance with the present invention; and

FIGS. **12** and **13** illustrate perspective views of a second embodiment of a wrap display system in a wrapped state and an unwrapped state, respectively, in accordance with the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

One inventive principle of the present invention is to structurally configure a flexible display unit including an integration of a flexible display and a display cover that can be wrapped and unwrapped from around a stick. The present invention does not impose any limitations or restrictions as to the integration of the flexible display and the display cover. Thus, the term "integration" is broadly defined herein as an assembly of the flexible display and the display cover as a single unit, such as, for example, a mounting of the flexible display onto an external surface of the display cover, or a positioning of the flexible display within a multi-layered display cover where the flexible display is viewable through an open window or a transparent window of the display cover.

The present invention also does not impose any limitations or restrictions on the structural configuration and material composition of a flexible display and a display cover of the present invention. In one embodiment, a flexible display of the present invention can be a provided by Polymer Vision, which has a layered flexible display consisting of a back layer of a thin/organic film serving as a base, a middle layer of organic electronics serving as an active matrix for driving the images of the flexible display, and a top layer of an electronic ink printed or otherwise disposed on a plastic sheet.

In practice, the specific implementations of a flexible display unit of the present invention is dependent upon the commercial implementations of the present invention, and are therefore without limit. The following descriptions of FIGS. **1** and **2** provide exemplary embodiments of flexible display units of the present invention incorporating the aforementioned first inventive principle of the present invention.

In one embodiment, as illustrated in FIG. **1**, a flexible display unit **20** of the present invention employs a flexible display **21** and a display cover **22** integrated relative to a display section **23** of display cover **22**. An attachment section **24** of display cover **22** facilitates an coupling of flexible display unit **20** to a stick in any conventional manner. The dimensions of attachment section **24** can be selected to be less than, equal to or greater than a perimeter of the stick. Additionally, a portion of attachment section **24** can be coupled to